

REMARKS

1. The Amendments and the Support Therefor

No claims have been canceled or added, and claim 1 has been amended to leave claims 1-20 in the application. No new matter has been added by the amendment to claim 1, which fixes an inadvertent punctuation error (replaces a comma for a period), and also clarifies that the recited fibers are embedded in the recited matrix (as depicted in the application's drawings).

2. Information Disclosure Statement (Form PTO-1449)

Please note that a supplemental Information Disclosure Statement (with fee) accompanies this Response. Kindly take the newly-cited references into account when reviewing this application.

3. Sections 1-2 of the Office Action: Restriction Requirement

Please note that a Petition From Requirement for Restriction was filed in this case on August 5, 2003, but the undersigned attorney has not yet received any word regarding whether the Petition was or will be granted.

4. Section 3 of the Office Action: Rejection of Claims 1-13 under 35 USC §112(2)

Claims 1-13 are rejected under 35 USC §112(2) because:

It is unclear whether or not the structural reinforcing strip comprises of a, b, c and several fasteners or a structural reinforcing strip comprising a, b, and c and is attached to a surface that has fasteners. It is unclear as to whether or not the "wherein" clause of claim 1 is for intended use of the strip.

Kindly reconsider the rejection. Claim 1 recites a strip having elements a, b, and c "affixed to the surface of a structure by several fasteners inserted through the strip and into the structure"; thus, it plainly recites a strip attached by fasteners, in use on a structure. It is submitted that the plain language of claims 1-13 accord with 35 USC §112(2), since an ordinary artisan would comprehend the bounds of the claims when read in light of the specification. As noted by the Court of Appeals for the Federal Circuit in *Miles Laboratories Inc. v. Shandon Inc.*, 27 USPQ2d 1123, 1126 (Fed. Cir. 1993):

The "distinctly claiming" requirement [of 35 USC §112(2)] means that the claims must have a clear and definite meaning when construed in the light of the complete patent document. ... Section 112 thus ensures definiteness of claim language. ... The test for definiteness is whether one skilled in the art would understand the bounds of the claim when read in light of the specification. ... If the claims read in light of the specification reasonably apprise those skilled in the art of the scope of the invention, Section 112 demands no more.

(Citations omitted.) Here, it is believed that the meaning of claim 1 is clear and definite, both when read in a vacuum and even more so when read in light of the specification. Please note MPEP 2173 *et seq.*, particularly MPEP 2173.02 ("Clarity and Precision"). The bounds of the claim are clear: infringement occurs if one has a strip with elements a-c "affixed to the surface of a structure by several fasteners inserted through the strip and into the structure." The *Miles* test is therefore met, and the rejection should be withdrawn.

5. Sections 4-5 of the Office Action: Rejection of Claims 1-4, 7-11 and 13 under 35 USC §102 in view of U.S. Patent 5,648,138 to Tingley

It is initially important to review *Tingley* in greater detail. The embodiments of FIGS. 5a-5c of *Tingley* are discussed at column 5 line 10 onward. The FIG. 5a embodiment is formed of parallel synthetic fibers 24 having lengths extending along the lengths of panel 22, with the fibers being encased in resin 26 (column 5 lines 10-17). As noted particularly at column 5 lines 17-19, 39-51, and 57-65, the fibers 28 are portions of the parallel fibers 24, which are made to "hair up" from the resin 26 by abrading the surface of the panel 22. These "hairs" then allow the panel 22 to better stick to other objects when adhered thereon with adhesives (see also column 2 lines 21-25).

As discussed at column 6 lines 29-53, FIG. 5b then illustrates an embodiment wherein outer second fibers 31 are placed about the parallel fibers 30 (nearer to the surface 32 of the panel 22), and wherein these second fibers 31 are chosen to "hair up" better in circumstances where the "core" parallel fibers 30 will not do so (see particularly column 6 lines 35-37). FIG. 5c then simply illustrates an embodiment wherein an outer fiber mat 35 is used instead of individual fibers (column 6 lines 54-67), with the mat being depicted as a woven one in FIG. 5c.

Turning then to the present invention, first note that the presence of nondirectional fibers is recited at clause b. "Nondirectional fibers" is a term of art, signifying randomly oriented fibers. See, e.g., page 7 lines 9-10 of the present application;¹ see also U.S. Patent 5,091,248 to *Belli* (portions of which are attached), entitled "Composition for precluding separation of nondirectional fibers from surface of drumhead laminate" and noting, e.g., at column 1 lines 6-13 that nondirectional fibers are "randomly orientated."

To anticipate, every element and limitation of the claimed invention must be found in a single prior art reference, arranged as in the claim. MPEP 2131; *Brown v. 3M*, 60 USPQ2d 1375, 1376 (Fed. Cir. 2001). Regarding claim 1 and dependent claims 3-4, 9, and 10, these are not anticipated because *Tingley* does not anywhere disclose the use of nondirectional fibers. In particular, *Tingley's* panels do not contain embedded nondirectional fibers, which claim 1 has been amended to specifically recite. There is also no suggestion as to why nondirectional fibers might be beneficial, particularly since *Tingley's* beams are intended to be subjected to bending/tensile stresses and thus they require high strength in the longitudinal direction (see, e.g., column 4 lines 8-25). The addition of fibers oriented in other than longitudinal directions would not contribute to this strength, and would add expense, occupy more space, and have no apparent benefit (see also column 2 lines 13-18).

Regarding claims 2 and 7-8, it can in no way be said that the fibers of *Tingley* are discretely spaced to allow accommodation of a fastener therebetween, or that they are in any spaced bundles. If it is believed that this feature is described, please specifically identify where this occurs.²

¹ "Nondirectional fibers 106, i.e., fibers which are not oriented in any predetermined directions, are then distributed transversely across the strip 100."

² "The factual determination of anticipation requires the disclosure in a single reference of every element of the claimed invention. . . . It is incumbent upon the examiner to identify wherein each and every facet of the claimed invention is disclosed in the applied reference." *Ex parte Levy*, 17 USPQ2d 1461, 1462 (Bd. Pat. App. & Int. 1990), citing to *Lindemann Maschinenfabrik GmbH v. American Hoist and Derrick*, 730 F.2d 1452, 221 USPQ 481 (Fed. Cir. 1984); see also 37 CFR §1.104(c)(2), MPEP 707.07(d).

6. Sections 6-7 of the Office Action: Rejection of Claims 1 and 5 under 35 USC §103(a) in view of U.S. Patent 5,648,138 to Tingley and U.S. Patent 5,127,783 to Moghe

Tingley is described above in Section 5 of this Response. Looking then to the secondary reference, *Moghe* plainly describes only directional (i.e., oriented in a pattern) fibers. In fact, all forming apparatus/methods described by *Moghe* (e.g., in Figs. 1D-1E) are incapable of generating nondirectional fibers. Since *Moghe* nowhere describes or suggests the use of nondirectional fibers, *Moghe* cannot in any way suggest their use with *Tingley*. If it is still believed that *Moghe* somehow suggests the use of nondirectional fibers, kindly identify with particularity the location and content of the alleged disclosure or suggestion so that the Applicant may better respond.³ Also please note that *Moghe*, which relates to a *fastener* for use with composite panels rather than an actual panel or structural member (column 2 lines 43-48), would in fact suggest very little to one in the art of structural member design owing to the vastly different considerations involved with loading of structural members versus loading of fasteners: fasteners are generally subjected to intense loading in multiple degrees of freedom, whereas structural members are generally subject to far simpler and lower loads. Stated more simply, a skilled artisan would not look to the field of nail design when seeking to design a better board.

7. Section 8 of the Office Action: Rejection of Claims 1-3, 5-6, 11-13 and 19-20 under 35 USC §103(a) in view of U.S. Patent 5,640,825 to Ehsani and U.S. Patent 5,127,783 to Moghe

Initially, please note that these rejections are confusing because some are phrased as anticipation rejections (and they rely only on *Ehsani* and do not refer to *Moghe*); others are phrased as conventional obviousness rejections, and refer to both references; and some do not refer to specific claims. It is therefore difficult to make a specific response. Following is a

³ "[W]hen the PTO asserts that there is an explicit or implicit teaching or suggestion in the prior art, it must indicate where such a teaching or suggestion appears in the reference," *In re Rijckaert*, 28 USPQ2d 1955, 1957 (Fed. Cir. 1993) (citing to *In re Yates*, 211 USPQ 1149, 1151 (CCPA 1981)); see also 37 CFR §1.104(c)(2).

response to the rejections as understood.

The secondary reference *Moghe* has already been summarized in the foregoing Section 6 of this Response. Turning then to the primary reference, U.S. Patent 5,640,825 to *Ehsani*, a careful review reveals two primary embodiments of the *Ehsani* invention:

- (1) The use of a strap 12 of "composite fabric" as a reinforcement member, wherein the strap is epoxied to the underlying structure (FIG. 1 and column 3 lines 28-43), and/or bolted to the underlying structure (FIG. 2 and column 3 lines 45-54, and/or FIG. 3 and column 3 lines 55-63). The structure of the fabric is described at column 2 lines 38-47, and the fibers are explicitly noted as being oriented (column 2 lines 44-47, column 5 lines 5-8). See also column 4 line 36-column 5 line 10.
- (2) The use of a fast-curing liquid mixture as a reinforcing agent, wherein the mixture is a resin bearing non-continuous fibers (FIGS. 4-5 and column 3 line 64-column 4 line 25; also see column 2 lines 58-65). Since the mixture is sprayed or troweled (column 2 lines 61-63, column 4 lines 4-7), the fibers are necessarily nondirectional (unless some unusual and unknown measures were taken to orient them when the mixture is applied).

Thus, note that the rejections are predicated on an understanding of *Ehsani* which is mistaken insofar as it commingles these two embodiments: *Ehsani*'s straps do not in fact contain nondirectional fibers. *Ehsani* therefore does not by itself anticipate any claims. Further, *Ehsani* and *Moghe*, taken in combination, do not render obvious the claimed invention. As an example, neither reference teaches the use of a strap containing nondirectional fibers, and this matter is not suggested by the references since one of ordinary skill would ascertain no true benefit to incorporating *Ehsani*'s nondirectional fibers from *Ehsani*'s liquid mixture into *Ehsani*'s strip: there is no apparent benefit to doing so (and more telling, note that *Ehsani* does not do so).⁴ While the Examiner states at page 6 that it would be obvious to incorporate both oriented and nondirectional

⁴ Consider also that the advantages noted by *Ehsani* at column 5 line 21 onward – e.g., the high tensile strength noted by *Ehsani* at column 5 lines 29-34 – all relate to the composite straps and their use of oriented fibers, implying that the only reason *Ehsani* ever bothers to resort to the use of nonoriented fibers at all is because there is simply no (known) way of obtaining oriented fibers when using a liquid mixture which is sprayed, troweled, or similarly applied.

fibers into a strip because "both embodiments provide the same function of reinforcement", this is hindsight: there is no indication of any benefit that would be gained from the arrangement (i.e., there is no true motivation to make the claimed arrangement). See, e.g., MPEP 2143 (particularly under headings "THE PRIOR ART MUST SUGGEST THE DESIRABILITY OF THE CLAIMED INVENTION" and "FACT THAT REFERENCES CAN BE COMBINED OR MODIFIED IS NOT SUFFICIENT TO ESTABLISH PRIMA FACIE OBVIOUSNESS"). If it is believed that some motivation is in fact present, it is respectfully requested that the location and content of the alleged motivation be identified so that the Applicant may better respond.⁵

Additionally, several obviousness rejections are predicated on the basis that claimed features are "optimizable features" whose values are within the ordinary skill of the art. These are not proper *prima facie* obviousness rejections, as they provide no indication as to where the prior art teaches or suggests the claimed matter. It does not matter whether a claimed feature is "optimizable" or not; almost all claimable features of *any* invention are "optimizable," and characterizing them as such does not relieve the need to establish the bases for a *prima facie* case of obviousness, as noted in MPEP 2142-2143. See also, e.g., *In re Rouffet*, 47 USPQ2d 1453, 1457-1458 (Fed. Cir. 1998):

To prevent the use of hindsight based on the invention to defeat patentability of the invention, this court requires the examiner to [1458] show a motivation to combine the references that create the case of obviousness. In other words, the examiner must show reasons that the skilled artisan, confronted with the same problems as the inventor and with no knowledge of the claimed invention, would select the elements from the cited prior art references for combination in the manner claimed.

Also note that the reasoning underlying these rejections requires reconsideration in any event. At page 5 of the Office Action, it is asserted that it "would be obvious to one of ordinary skill in the art to have the spaces between the parallel fibers be large enough to accommodate the fasteners" – but this statement is not supported by the facts. Note that *Ehsani* does not follow this arrangement; *Ehsani* simply sends the fasteners through the fibers (see FIG. 2). Also, at page 6 of the Office Action, it is reasoned that the fiber/resin content recited in claim 13 is obvious

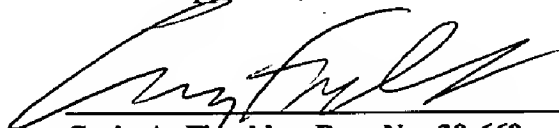
⁵ See prior Footnote 3.

because it results in high strength. However, if this is so - i.e., if one would be driven to add more fiber to achieve greater strength - this would then teach toward a percentage of fibers *even greater* than the one recited in claim 13 (which is readily achievable); see, e.g., column 8 lines 40-41 of the *Tingley* patent discussed in Section 5 of this Response, discussing a 65% fiber content). In short, please consider and identify: is there really and objectively ascertainable motivation present in the art of record which would truly lead one of ordinary skill to modify the prior references to attain the claimed invention? We submit this is not the case.

8. In Closing

If any questions regarding the application arise, please contact the undersigned attorney. Telephone calls related to this application are welcomed and encouraged. The Commissioner is authorized to charge any fees or credit any overpayments relating to this application to deposit account number 18-2055.

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ATTACHMENTS:

- U.S. Patent 5,091,248 (cover, cols. 1-2)
- Supplemental Information Disclosure Statement



US005091248A

United States Patent [19][11] **Patent Number:** **5,091,248****Belli**[45] **Date of Patent:** **Feb. 25, 1992****[54] COMPOSITION FOR PRECLUDING SEPARATION OF NONDIRECTIONAL FIBERS FROM SURFACE OF DRUMHEAD LAMINATE****[75] Inventor:** Remo D. Belli, North Hollywood, Calif.**[73] Assignee:** Remo, Inc., N. Hollywood, Calif.**[21] Appl. No.:** 631,199**[22] Filed:** Dec. 20, 1990**Related U.S. Application Data****[63]** Continuation-in-part of Ser. No. 483,897, Feb. 23, 1990, abandoned.**[51] Int. Cl.:** B32B 27/04**[52] U.S. Cl.:** 428/290; 428/518; 84/414**[58] Field of Search:** 428/287, 290, 520, 518; 84/414**[56] References Cited****U.S. PATENT DOCUMENTS**

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3,702,785	11/1972	Knechtges	117/155
3,706,595	12/1972	Drelich	117/38

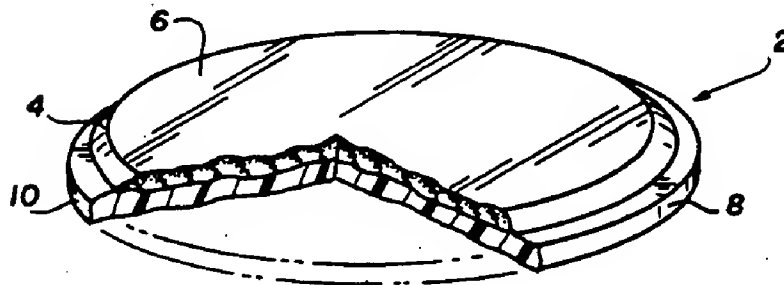
4,044,180	8/1977	Baker	428/287
4,308,782	1/1982	Hartry	84/414
4,374,894	2/1983	Antefruger	428/288
4,446,177	5/1984	Munoz et al.	428/483
4,742,753	5/1988	Speed	84/414
4,779,508	10/1988	Beals	84/414
4,892,782	1/1990	Fisher et al.	428/242

FOREIGN PATENT DOCUMENTS

1108547 5/1986 Japan

Primary Examiner—Merrell C. Cashion, Jr.*Assistant Examiner*—Robert J. Follett*Attorney, Agent, or Firm*—Rapkin, Gitlin & Moser**[57]****ABSTRACT**

A lamination comprising an upper fabric layer made of nonorientated polyester fibers, a lower plastic layer, and a substance which, when applied to the surface of the polyester fabric, creates a seal thereon and impregnates the material acting to further create a bond among and between the polyester fibers to preclude delamination of the fibers when the fabric surface is exposed to the constant pounding of drumsticks or the continuous circular and sweeping motion of a drum brush.

8 Claims, 1 Drawing Sheet

COMPOSITION FOR PRECLUDING SEPARATION OF NONDIRECTIONAL FIBERS FROM SURFACE OF DRUMHEAD LAMINATE

FIELD OF INVENTION

The present invention relates generally to the area of drumhead construction and, more particularly, to a head for a drum that includes a synthetic plastic sheet material, a polyester fabric material laminated thereto and a copolymer coating applied to seal the fabric material and impregnate and preclude delamination of the randomly orientated fibers therein.

Drumheads of a variety of types are well known in the prior art. A pertinent and interesting discussion of the prior art in this area is contained in Hartry, U.S. Pat. No. 4,308,782. The principal improvement claimed in Hartry is the laminated drumhead comprising a synthetic fabric material of continuous filament polyethylene fibers, also known as spunbonded olefins, that are randomly arranged, which acts to distribute load without transferring stress and provides an improved brush surface, and a synthetic plastic sheet material, which acts as the primary load carrier. Though clearly a substantial improvement over the prior art, the Hartry invention did not address a very critical problem in the technology relative to the delamination of the nonorientated polyethylene fibers in the fabric material.

Polyethylene fibers or spunbonded olefins have often been the material of choice in the prior art for use in the construction of drumhead laminates. The material is extremely versatile for use in many applications and, because of its strength, lightweight and smooth finish, has been adopted for use in the manufacture of drumheads and related products. However, because a drumhead is subjected to constant stressful pounding, it will normally suffer from a high degree of surface delamination after time. In large part, this is due to polyethylene's characteristic lack of liquid absorbency contributing to the difficulty in the bonding between the polyethylene fibers and the copolymer coating, which is introduced as an essential ingredient to contribute additional bonding strength and offer greater resistance to water and gas infiltration. Thus, as the drum brush strokes the polyethylene fabric surface in a circular or sweeping motion, the fibers eventually come apart and separate from the drumhead surface, forming elevated hairlike filaments in which the wire or nylon bristles of the drum brush become entangled. Separation of the polyethylene fibers also occurs as a result of the constant pounding of the drumstick upon the fabric surface. The tonal quality of the drumhead is thus negatively affected and the usefulness of the drum brush as a drum instrument clearly diminishes. Efforts to solve the delamination problem, including the application of a wide variety of plastic coatings on the polyethylene fabric surface, have failed. The fibers within the fabric separate irrespective.

The present invention solves the aforesaid problem by utilizing a combination of elements, including polyester fabrics and a polyvinylidene chloride copolymer, which were previously unknown and unexplored in the drumhead technology and which also, when working in concert, succeed to maintain both the integrity of the laminated drumhead, including the preservation of the requisite degree of tonality for drums and similar types of instruments, and totally eliminate any separation of the nonorientated fibers in the fabric material to prevent

the entanglement of the drum brush bristles in the synthetic hairlike fibers that form on the fabric surface.

SUMMARY OF THE INVENTION

The present invention provides for a lamination comprising an upper fabric layer made of nonorientated polyester fibers, a lower plastic layer, and a substance which, when applied to the fabric, creates a seal on the surface and impregnates the material acting to further create a bond among the fibers. This combination of elements thus precludes delamination of the polyester fibers, particularly when the fabric surface is exposed to the constant pounding of drumsticks or the continuous circular or sweeping motion of a drum brush.

The preferred combination of elements that constitute the present invention includes a fabric layer comprised essentially of spunbonded polyester and a coating of a vinylidene chloride copolymer in a colloidal emulsion state. The spunbonded polyester has an exceptionally high degree of absorbency to liquids. Thus, the emulsified vinylidene chloride copolymer not only coats the polyester fabric surface, it deeply impregnates the underlying randomly orientated fibers as well. The copolymer is also absorbed by the polyester fibers to create a bonded surface that is not only water and gas repellent, but more importantly extremely resistant to delamination.

Properties of vinylidene chloride copolymer include, among others, high tensile and tear strength and its resistance to moisture, temperature, sunlight, chemicals and abrasion. The copolymer's principal contribution to the present invention, however, derives from the crystalline nature of the compound itself and the exceptional ease with which it bonds tightly to the polyester fibers to prevent delamination. When applied, the copolymer penetrates the surface of the polyester fabric, impregnating the fibrous layers where it dries to a hard resin, totally sealing the surface and tightly bonding the layers and fibers together.

Accordingly, an object of the present invention is to provide a laminated head of a drum or similar musical instrument that precludes delamination of the nonorientated fibers in the synthetic fabric material.

Another object of the present invention is to provide a laminated head of a drum or similar musical instrument that precludes delamination of the nonorientated fibers in the synthetic fabric material while maintaining the integrity of the brush surface and brush response.

Still another object of the present invention is to provide a laminated head of a drum or similar musical instrument that precludes delamination of the synthetic fabric material without detracting from the tonal quality of the drumhead.

Still another object of the present invention is to provide a laminated head of a drum or similar musical instrument that precludes delamination of the synthetic fabric material by application of a chemical compound that seals the fabric surface and penetrates the same surface to impregnate the fibrous layers and bind the nonorientated fibers therein.

Still yet another object of the present invention is to provide a laminated head of a drum or similar musical instrument that precludes delamination of the synthetic fabric material that can be easily and efficiently manufactured.

Other objects and advantages of the present invention will become apparent in the following specifications when considered in light of the attached drawings